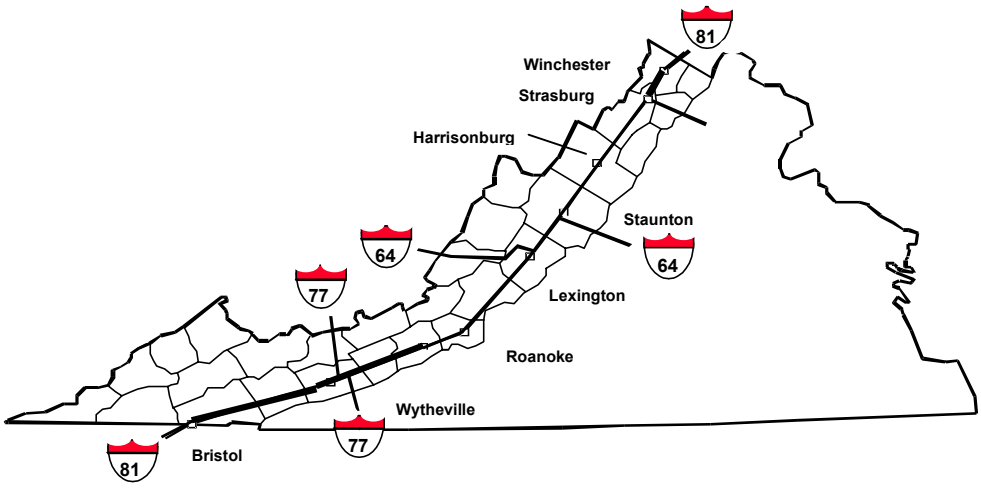
REPORT OF THE

INTERSTATE-81

SAFETY TASK FORCE



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On Behalf of the Task Force

March 2000

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Preface

The I-81 Safety Task Force was charged with soliciting views and comments from users and citizens of the I-81 corridor. The Task Force did not make specific recommendations. Instead, this report presents an analysis of the findings from the hearings. The following topics were cited most frequently and should be addressed by appropriate federal, state, and local authorities who possess the expertise and authority to do so:

- Truck Equipment and Operation Safety
- Passenger Vehicle Driver Education
- Law Enforcement
- Set Back Requirements at Interchanges
- Signage
- Incident Management
- Alternative Modes and Routes
- Engineering, Redesign, and Construction
- Separation of Passenger and Truck Vehicles
- Dedicated Lane for Trucks
- Intelligent Transportation Systems

Interstate-81 Safety Task Force Report

I. Introduction

A. The I-81 Safety Task Force Membership Charge and Background

The I-81 Safety Task Force originated under the auspices of Congressman Frank Wolf of the Tenth Congressional District. He was joined by Congressman Goodlatte of the Sixth Congressional District and Congressman Boucher of the Ninth Congressional District. The idea for the Task Force was generated at a meeting called by Congressman Wolf and held at James Madison University on January 5th, 1999. The districts of these three Congressmen encompass the entire I-81 system in Virginia. The Task Force consisted of the following persons: The Honorable John O. Marsh, Chairman; The Honorable Bobby Berkstresser, Rockbridge Board of Supervisors; Mr. James Browder, Virginia Department of Transportation; Ms. Joyce Curtis, Federal Highway Administration; Col. Jim Groves, Virginia Military Institute; Mr. Doug Houff, Houff Transfer; Dr. John Noftsinger, James Madison University (Secretary); Mr. Ray Pethtel, Intelligent Transportation Systems; Mr. Dick Phillippi, Contractor / Developer; Captain John Quinley, Virginia State Police; Mr. Paige Will, Rockingham County Board of Supervisors.

There were four hearings by the Task Force: Winchester on March 29th, hosted by Congressman Wolf; Abingdon on June 21st, hosted by Congressman Boucher; and Lexington on August 12th, hosted by Congressman Goodlatte. The final hearing was at Woodstock on November 29th, 1999. The minutes of each meeting appear in Appendices A-D. Included in the minutes are a number of issues that are of local concern, such as perceived roadway inadequacies in certain areas like Arcadia and setback limits at exit ramps.

It should be noted that a number of members of the General Assembly appeared at hearings in their areas and took the opportunity to present their own views, as well as views of their constituents.

The purpose of these hearings was to solicit views and comments from those who live in the area and were users of the I-81. A broad range of views and suggestions for improving and managing I-81 were received. This report seeks to summarize views that were expressed in the meetings, and by communications from constituents to the three members of Congress involved. Congressional offices made available a number of letters that had been submitted expressing concerns over I-81. Letters specifically to the Commission are included in Appendix E. Individual letters to Congressmen are not included for reasons of protecting the confidentiality of the sender.

In each of these meetings, certain themes emerged. Among them were growing concerns based on travel experience by motorists, set back requirements at exits which might impact local business and municipalities; truck usage and behavior, better signage, greater utilization of new technologies, greater police supervision, and risks associated with high speeds.

An issue raised in several of the hearings (Winchester, Abingdon and Lexington) related to the proposed set back lines on the improved Interstate, particularly at exits. Briefers for the Virginia Department of Transportation indicated that tentative planning contemplated 300 feet to which there were concerns expressed involving certain locations; however, department officials pointed out plans had not been finalized and there would be the opportunity for the expression of views at future hearings when the proposed plans were completed.

The concerns expressed came from several sources i.e.; local governments which had questions of possible lost revenues if exit businesses were adversely impacted; business groups such as "fast-foods" and motels should there be a taking of real estate to achieve the set back, and tourism facilities, for example The New Market Hall of Valor.

It should be noted that on June 18th, 1999, there was a special meeting with senior leaders of the Department of Transportation at Stephens City. This meeting was called and hosted by State legislators from the Northern Valley to discuss this issue. This was not a meeting of the I-81 Task Force; however, it bears on issues raised with Task Force. At the Stephens City meeting Department officials indicated their awareness of the issue. Although no commitments were made, officials agreed that the planning process would be sensitive to this matter. The fact that there would be further public hearings to consider the completed plans was again reiterated. While this report was being prepared, legislation was introduced in the Virginia General Assembly to deal with this issue. This matter may be resolved through the various avenues currently pursued.

The purpose of the panel was to provide forums for expression of views of citizens and other users of I-81. The panel reports these expressions of views of citizens as findings. It does not seek to make recommendations in as much as it lacks the complete expertise and authority to do so. Many of the matters raised are questions that relate to engineering, design, and construction. These are questions, which go beyond the scope of the panel and its capability and authority. However, the panel hopes to make available to policy and decision makers at the state and federal level views it received about I-81, so these can be considered in the design and execution phase of the widening program.

B. The History and Challenge of I-81

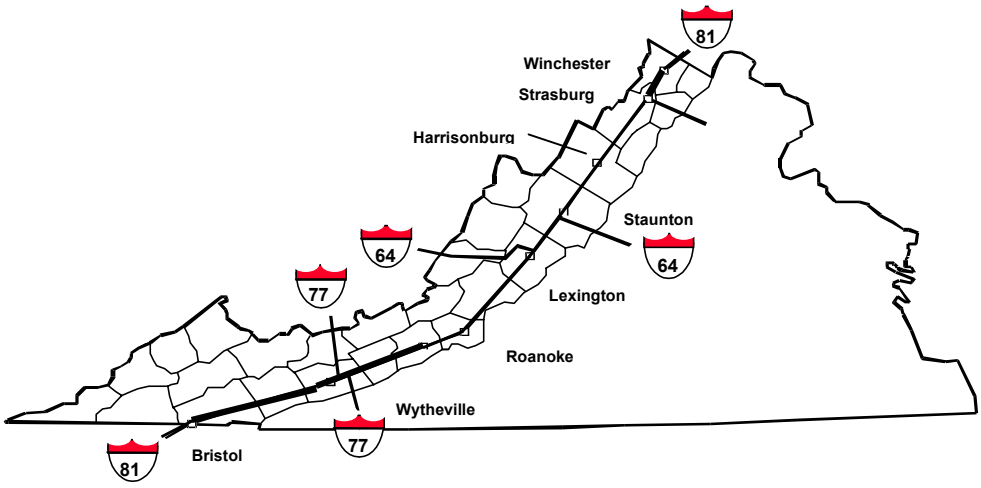
Interstate Highway 81 is 325 miles long. It is the longest Interstate in the Commonwealth of Virginia and considered to be one of the ten most scenic in the United States. It reaches from the Virginia line with Tennessee at Bristol and extends north down the Shenandoah Valley to the West Virginia border some ten miles north of Winchester.

Its construction began in the late 1950's under the Interstate Program sponsored by President Eisenhower. The enormous growth of traffic in the highway's forty-year history led to a plan to widen I-81with the addition of a

north- and southbound lane. This widening is an attempt to alleviate the congestion caused by traffic saturation.

I-81 connects six states: Tennessee, Virginia, West Virginia, Maryland, Pennsylvania, and New York, and has a total length of nearly 850 miles. Geographically, it is a main connection between the southern economic hubs of Atlanta, New Orleans, Houston, and Dallas to the northeastern United States. In Virginia, the I-81 Corridor serves the western part of the state, connecting Bristol in the south to Winchester in the north, a predominantly rural region which contains many historical sites and natural attractions. Scenically located between the Blue Ridge and Allegheny mountains, the 325 mile Interstate may be viewed as the predominate unifying physical attribute of the region.

Figure 1: Map of the I-81 Corridor of Virginia



I-81 Corridor in Virginia

The salient features of the corridor are highlighted below.

- **Population:** The population of the I-81 Corridor as shown above comprises about 19% of the State's total population.
- **Major Highways:** There are three other interstates (I-64, I-77, and I-66) that connect the I-81 corridor to other states and other areas in Virginia. Other major highways such as US 58, US 220, US 460, US 33, US 211, and US 17 also connect to I-81. US 11 is parallel to and intersects with I-81 throughout the entire corridor.
- **Traffic Volumes:** The average annual daily traffic volumes on I-81 ranges from approximately 32,000 to 55,000. Trucks compose a significant portion of the traffic stream. The truck percentage fluctuates throughout the corridor, generally ranging from 22% to 30% on average but with higher volumes experienced according to the day of week and time of day.

- **Higher Education:** The Corridor connects an important educational community. There are 29 institutions of higher education located throughout the corridor with a total enrollment that is about 27% of the total enrollment of Virginia.
- **Recreation:** There are many outdoor recreational opportunities to be found throughout the corridor: 59 public fishing waters, 48 historical areas, 21 state recreational areas, 11 state parks, 2 national forests, 2 state forests, a national recreational area, a national park, a regional area park, the scenic Blue Ridge Parkway, the Skyline Drive, and the Appalachian Trail.

With its strategic location, I-81 is important to both commercial and passenger traffic. The terrain throughout the corridor is mostly rolling and mountainous. Since the initial construction of the corridor in the 1950's and 60's, roadway design standards and safety requirements have changed. This has required VDOT to raise the vertical clearances of overpasses and provide spot safety improvements at various locations. While the safety improvements meet requirements at this point the longevity of the facility is limited without major improvements.

The cost to widen I-81 is estimated in present year dollars to be $3.4 billion, or about $10 million a mile. The construction time is projected to extend up to twenty years.

The corridor provides an important transportation link to the economic hubs and markets in the eastern United States. It also serves countless commuters around urbanized areas such as in Harrisonburg, Winchester, Roanoke, Blacksburg, Wytheville, and Bristol. The rolling terrain presents long up-grades, which complicate traffic conditions throughout the corridor. Vehicles, especially trucks, require significantly more room in rolling terrain. Additionally, the heavy truck volumes effectively use up the capacity of the right lane and thus severely limit the capacity of the facility during peak hours. The road section is frequently referred to as a "one lane road" because truck volume is perceived as using up one full lane of the capacity of the dual lane roadway. Because of its relatively early construction in the interstate program, it is also a narrow interstate and has been coined "The Alley" by many truckers.

Previous analysis of traffic conditions on I-81 and comment taken at public hearings raised several important concerns. The primary concern is about traffic safety in general. The accident rate has been increasing and the severity of crashes is high. There is a general perception that the mix of traffic, including a heavy truck volume, creates safety concerns for automobiles. Truckers testify that the general public does not understand how to drive in this mix of traffic and do not understand the different handling characteristics of trucks. The long term implications of the reconstruction of the roadway indicates there will be increasing congestion and delays during the extended construction periods.

C. Current Design and Reconstruction Status

The conceptual improvement studies for the 325 miles of I-81 were completed in 1998 and presented to the Commonwealth Transportation Board (CTB) for financing consideration and prioritization. The CTB funded

preliminary engineering for the first priorities in the 1999-2000 update of the Six-Year Program for the three Construction Districts. VDOT is in the process of acquiring consultants to design the I-81 improvements. It is anticipated that additional funding will become available in the next annual update of the Six-Year Program to continue project development of the corridor.

There appears to be little or no opposition to the planned widening; however, there is considerable difference of view on how that should be accomplished, and how traffic should be managed, especially between passenger vehicles and trucks. This report seeks to deal with some of these views and concerns.

D. The Traveling Public Perspective

Contributing most dramatically to the concerns of motorists is the increasing presence of truck traffic. In certain areas of this Interstate and at certain times, truck use exceeds 40%. The changing and growing economy of the United States has significantly increased truck traffic on all of the roads in the nation. A heavy demand for consumer products and the change by manufacturers to "rolling inventory" or "rolling warehouses" for "just in time delivery" (JIT) has placed more and bigger loads on roads. The North American Free Trade Agreement (NAFTA) and the realization of truckers that utilizing I-81 is the fastest route from Western Mexico to New York City have also contributed to the load of I-81. The suburban growth of Western Virginia and Virginia's popularity as a tourist destination have also placed more passenger traffic on I-81 as well.

The confluence of these factors causes people who utilize I-81 to frequently feel that the Interstate is much more crowded and dangerous than ever before. The frequent and often fatal accidents in the corridor, often involving trucks, coupled with individual passengers' occasional close calls with a less than thoughtful trucker, have all contributed to a siege mentality for passenger cars on I-81. This causes a real and growing anger against the truckers who sustain our local and national economy, but are often blamed for accidents and diminishing safety. The net effect of the current situation is that many local drivers are very emotional about the Interstate, afraid to use it, and very angry about it. Thus, the perceived time and distance between two given points on the corridor is effectively increased by traffic saturation and fear of driving. An evidence of this growing concern is the establishment of prayer groups in support of travelers of I-81 in the Roanoke area with the hope of expanding throughout the corridor.

E. The Transportation Industry Perspective

Safety, especially on I-81, is the number one priority of Virginia's responsible trucking industry. For professional truck drivers, the highway is their workplace. They wouldn't have it any way but safe for themselves, their families, and everyone else sharing the road. A constant, consistent presence of law enforcement is crucial to combating unsafe driving behavior on I-81 and reducing crashes. The trucking industry contends that an analysis of crashes on I-81 should be conducted to determine causative factors (driver behavior, engineering, etc.). Without this information and answers as to why crashes are

occurring, it is difficult to develop sound, effective recommendations for improving safety on I-81. The design for the reconstruction of I-81 should meet traffic volumes projected for 20 years from now so that, when completed, I-81 will not be over capacity as it is now.

The trucking industry strongly contends that if the speed limit is lowered on I-81 (or sections thereof), the speed limit should be the same for all vehicles. They offer numerous studies that have concluded that a speed limit differential between trucks and passenger vehicles causes more safety problems than benefits.

However, in the hearings there were views presented urging a speed limit for trucks of 55 mph, but retaining 65 mph limits for passenger type vehicles. Congressman Boucher of the Ninth Distruct advised the Task Force that the reduction of trucks' speed limits had been a recurring recommendation from many areas in his district. The point was made that reduction of truck limits could be accomplished rather quickly by action of the General Assembly.

It was pointed out by trucking advocates that lane restrictions should not be imposed on trucks where there are only two lanes in each direction. Under current Virginia law, on interstate highways with speed limit of 65 mph and three or more lanes in each direction, commercial vehicles are restricted to the two right-hand lanes. As lanes are added to I-81, this law will be applied on qualifying sections. However, this law could cause safety problems at heavily used interchanges, especially those with short acceleration lanes, as vehicles try to merge into traffic with all trucks being required to operate in the right lane(s).

There needs to be expanded public education about safe driving behavior. For example, truckers should be encouraged to be courteous to other vehicles in mountainous terrain by not driving side by side at a constant, slower speed for extended periods. Passenger vehicle drivers need a better understanding of trucks' blind spots and operating limitations, i.e., the "No-Zone."

There is a critical need for more truck parking in the I-81 corridor for fatigued drivers to rest and/or wait until businesses open for them to load and unload.

Technology can be used to improve safety. However, it should be deployed only if there is a proven safety benefit, not just for the sake of using new technology. For trucking fleets and their drivers, accurate, real-time information about congestion, traffic tie-ups, and the availability of truck parking for fatigued drivers to rest could be helpful. Emerging Geographic Information Systems and sensor technology hold great potential in this arena.

Interchanges and ramps should be designed to accommodate today's truck configurations. Also, safe speed advisories on ramps should be set differently for both cars and trucks with speed and "rollover" warning signs placed where drivers will have time to take appropriate action.

II. Alternatives

A. Enforcement

Incredulously, State Police report that they have observed motorists driving on I-81 while reading, grooming themselves, looking at scenery, or talking on a mobile telephone. Such actions offer the strongest potential for a crash at a high rate of speed. Enforcement is a very effective component of highway safety. High visibility patrol gives the impression of omnipresence. This provides a sense of encouragement to the law-abiding citizenry and acts as a deterrent to would be violators.

The Task Force heard views on the failure of some trucks to meet safety standards. Congressman Wolf has been in the forefront to address this issue. It has been pointed out that by and large truck operators support and comply with equipment standards. However, for that small minority of trucks which do not meet the standards, a substantial risk is posed for other I-81 drivers. This appears to be a major enforcement issue and should be vigorously pursued.

It was both interesting and enlightening to see the enthusiasm for strict enforcement of the speed and equipment laws from many who spoke representing both the general public and the professional trucking industry. Public comments provided often diametrically opposed solutions to address a similar enforcement need; such as, the use of stealth enforcement vehicles as opposed to marked vehicles or photographing violations and mailing summonses to vehicle owners, as opposed to police/violator interaction. Diametric as these proposed solutions were, it was apparent that enforcement is a viable solution. Motorists intent on enjoying a pleasant Interstate Highway drive are disappointed. The high speed and traffic volume encountered on I-81 require that vehicle operators give driving their full time and attention. The stress brought about by these speeds, traffic volume, as well as vehicle maneuvers and the loud hum of tires are natural impediments to a relaxed driving atmosphere. As if these are not enough to deal with, persons who lack self-discipline allow their frustration to turn to aggression and add road rage to the dangers potentially existing for the inattentive driver. Therefore, there were many advocates for enforcement and for additional troopers to be assigned to I-81 patrol.

B. Education and Public Information

Enforcement and engineering are just two elements required for a safe and efficient transportation system. Education is the third leg of the stool. Many years of study has shown that driver error is the most common contributing factor in vehicle crashes; therefore, more effective communication with the motoring public must be established.

The Commonwealth of Virginia is facing an extended period in which major reconstruction of the I-81 corridor will be undertaken. As such, we have an opportunity and a requirement to make a difference in the driving habits of the American public that use this corridor. The I-81 corridor is critical to Virginia's transportation system and the economy of the Commonwealth. This roadway space is a scarce resource that must be allocated between the required

reconstruction activities and the motorists. Therefore, it is imperative that the people living within the corridor and those traveling through the corridor fully understand the magnitude of the reconstruction effort and how best to drive through the region safely. Education and Public Information will be the linchpin to maximizing the safety and efficiency of the reconstruction activity and minimizing the adverse impacts to the motorists and surrounding communities. Coordinated education and public information campaigns will be developed to increase driver knowledge and awareness of work zone dangers, and driving tips will be provided to reduce the likelihood of a crash.

1. A New Era of Driving

Gone is the era when mutual respect was the driving force in the way people interacted with each other on the highway. Many truck drivers are no longer the gentlemen of the road. The same can be said for too many hurried motorists. Respect for lives and the personal property of others is no longer the norm, or at least that is how it appears. Accordingly, it is the responsibility of those of us who will be undertaking a major reconstruction project in the area to help turn the tide. It is fair to say that more than a majority of the people on the roads today feel that it is their right to be there, with little responsibility for common courtesy. Hence, the responsibility of changing the attitudes of the public at large rests with those who have the most influence: the elected officials, the local and state police, the media, and community activist groups.

Early education and periodic re-education are the most effective ways to improve driver behavior on our highways. The majority of licensed drivers today received their experience on the road, because there were a limited number of freeways open when they obtained their driver licenses. There have been few opportunities for them to receive updated information on pavement markings, the proper use of accel/decel lanes, as well as other signs, which have changed over the years. Why else would we have motorists entering a highway at its intersecting point without using the full length of the acceleration lane to ease into traffic? Why is the common courtesy of allowing someone to enter the freeway considered a sign of weakness?

In the four public meetings that were held along the I-81 corridor, one recurring theme was the ability to share the road--not only with the trucks, but with other passenger vehicles as well. There are some misconceptions about what trucks can and cannot do. There are some misunderstandings about the safety of the commercial vehicles themselves. Passenger vehicles need a better understanding of trucks' blind spots and operating limitations. In addition, it appears the average motorist does not thoroughly understand how the trucking industry impacts every aspect of our daily lives, from what we wear to what we eat.

Because it is nearly impossible to educate all the citizens who will be impacted during the reconstruction of I-81, it is important for the key groups who have the most influence to be kept well informed of upcoming events, the use of new technologies and the best practices that will be implemented.

This group of highly respected citizens can then spread the information throughout their spheres of influence.

The education and public information provided needs to be geared around human behavioral characteristics, as well of those of the highway. That information will include: driver expectancy and attentiveness, traveler information, and sight distance and visibility. Driver expectancy relates to the driver's readiness or ability to respond to situations or information in a predictable manner. When driver expectancies are taken into account, they usually respond in an error-free manner. If drivers are provided with real and accurate traveler information, then they will make educated decisions that improve their attitudes while on the road. Finally, the driving task is a complex and complicated one that requires quality attention. Therefore, drivers make the best choices when their visibility is adequate. They cannot respond to what they cannot see. It is our job to improve public awareness and give them the knowledge and skills to get to their destination safely.

2. *Education is the Key*

Although we found areas for improvement in the education and public information domain, there are educational activities currently being implemented around the state and in the corridor. The following is a partial list of those activities:

a) The "No Zone" program, started in Chesterfield County, educates drivers about safe driving in truck traffic and has been expanded statewide. There are still some glitches that need to be worked out, including the need for enough motor carriers to participate to meet the existing demand and obtaining the required permission to get in all the high schools.

b) The Federal Motor Carrier Safety Administration provides education on an ongoing basis to the motor carrier industry on regulatory compliance and crash prevention at industry seminars and workshops.

c) The American Trucking Association develops Hot Spots for cars and commercial vehicles and has released that information for other facilities, including the Capital Beltway. This can be done for the I-81 corridor as well. It identifies potential problems because of congestion, topography, construction and the like.

d) Presently, the Department of Motor Vehicles is rewriting the Drivers education curriculum to include sections on sharing the road with large vehicles.

There are many negative perceptions about the I-81 corridor, while in fact this facility has many positive aspects and handles a large volume of traffic well, considering the demands and terrain. Improved communications with the public as to what is working and the improvements that have been implemented will help achieve increased understanding and support. In addition, an improved relationship needs to be developed with the local media, so that all the facts are made known and both the positive and

negative attributes of the system can be accentuated as we augment the education of our drivers to improve driver behavior.

The following is a potential list of initiatives that could be undertaken as we proceed with our major reconstruction efforts.

Suggested Short-Term Educational Actions:

- Interactive safety training modules presented at local community meetings addressing issues on engineering, enforcement and commercial vehicle operations. A question and answer session on facts related to highway safety (i.e. commercial motor vehicle inspections, federal motor carrier regulations).
- Develop brochures that address the capabilities of a truck: stopping distance required at varying speeds, blind spots (No Zone) and other pertinent information. These brochures can be available at: grocery stores, gas pumps, rest areas, and university campuses.
- Initiate a newsletter to provide elected officials, citizens, and the media highlights of activities along the corridor (i.e. new motorist assistance patrols, traveler information services, dynamic message signs, traveler assistance radio) and information on how to share the road.
- Provide updates on alternate routes available during construction.
- Federal Highway Administration (FHWA), Virginia Department of Transportation (VDOT), Virginia Trucking Association (VTA), and the Virginia State Police (VSP) take a safety module and a commercial vehicle to area high schools to educate them on the "No Zone" and how to share the road with trucks. Since this corridor has a tremendous number of universities, the training workshop can be made available on those campuses as well.
- Increase education on driving through work zones.
- Encourage the use of free cellular service to report non-emergency situations, such as a disabled vehicle.
- The FHWA published a book called "Read your Road," which was widely distributed several years ago. This information, which reiterates what various pavement markings or highway signs mean, could be shared at orientation with colleges in the area.
- The American Trucking Association can share their list of I-81 hot spots with the media for distribution to the public at large.

Suggested Long-Term Educational Actions:

- Obtain an endorsement to develop focus groups to determine the most important information and concerns for the area, as well as an analysis of crash data.
- Seek Department of Motor Vehicle concurrence in including freeway driving in licensing testing.
- Develop and implement a program to improve driver courtesy and attitudes.
- Use dynamic message signs to display traveler information.
- Encourage the use of the Traveler Advisory Radio or other sources of traveler information, such as Travel Shenandoah.

- Display videotapes that stress safe driving habits at area Department of Motor Vehicle Offices.
- Develop public service announcements that depict key driving behaviors that need to be changed.
- Develop a fact book that provides the elected officials the latest information on the upcoming project. The fact book will include a description of work, need for the project, total cost, current status, start date, completion date, and any particular transportation strategies that might be put into place.

C. Incident Management

Incidents are crashes, debris on the roadway, sinkholes, construction and maintenance operations, and any other event or activity that reduces the capacity of the roadway. Incidents that block one lane on a four-lane freeway like I-81 reduce capacity by as much as 70% because of the so-called rubbernecking effect, motorist slowing to see what is happening. Even weather is sometimes considered an incident because rain reduces capacity by 10-15% and snow reduces capacity by as much as 40-50%. The reduction in capacity causes congestion and delays when the remaining capacity is less than the traffic demand. Incidents occur frequently on I-81 and many of those are major incidents – incidents that close one or more lanes for one or more hours. Incidents not only cause delay, but are a severe safety concern as well. Secondary incidents, those that occur in the back-up resulting from the initial incident, are also a major problem. Secondary incidents are frequently severe as traffic moving at highway speed unexpectedly comes upon stopped or slow moving traffic.

Incident management strategies are designed to 1) reduce the time required to detect and verify an incident has occurred, 2) provide the optimum response, 3) manage the incident scene efficiently including traffic management at and around the incident scene 4) clear the incident as quickly as possible, and 5) provide accurate, timely traveler information to permit motorists to avoid the incident scene all together. Key components of these strategies include well-developed, pre-planned response plans, coordination and cooperation among the response agencies, and the availability of response agencies and equipment.

A great deal of progress has been made in Virginia and in the I-81 corridor in recent years to improve incident management. The Statewide Incident Management (SIM) Committee meets several times a year, and has developed a number of recommendations that have been adopted throughout the state. The SIM Committee is composed of all of the public sector response agencies in the state – transportation, state and local police, fire, Emergency Management Services, emergency management – as well as the private sector representing the towing and recovery industry. Currently incidents are generally reported promptly to the state police by passing motorists using wireless telephones to call 9-1-1 or #77. VDOT and the Virginia State Police have developed diversion plans for the full length of I-81 for those occasions when traffic has to be diverted, but the capacity on US 11 and other alternate routes simply cannot handle I-81 traffic without significant delays. Technology is also now playing a

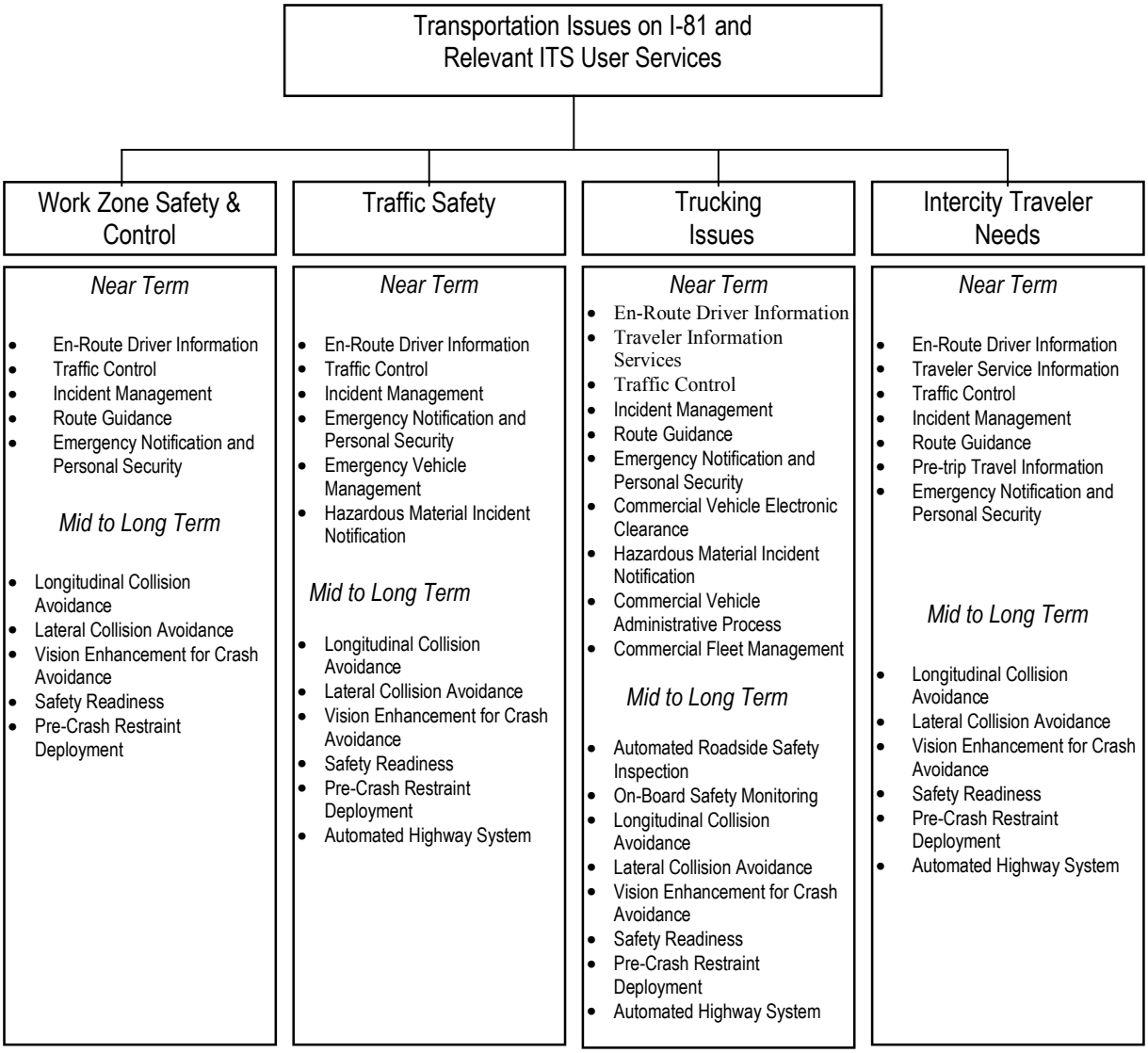
more important role in supporting effective and efficient incident management (please see the next section on Intelligent Transportation Systems.)

D. Engineering and Redesign

1. Short Term - Intelligent Transportation Systems

There are a host of opportunities for advanced technology in the I-81 Corridor. An analysis completed by the Center for Transportation Research at Virginia Tech has identified approximately twenty five Intelligent Transportation System services that were developed as part of the National ITS Program Plan as being applicable to I-81 needs. These applications can be viewed as Near Term, Mid Term, and Long Term based on readiness for deployment. Table 1 below outlines the application:

Table 1:



In addition, a number of current technologies can be enhanced. These include such developments as enhancing the use of a fiber-optic backbone for traffic management, development of regional and district operations centers, development of advanced traffic and traveler information systems, and more effective use of permanent and portable variable message signs.

The National ITS Program Plan (ITS AMERICA & US DOT, May 1994) has identified twenty-nine inter-related user services as part of the ITS national planning process. These user services were developed based on user needs. These services have been grouped into seven bundles: travel and transportation management, travel demand management, electronic payment, emergency management, commercial vehicle operations, advanced vehicle control and safety systems, and public transportation management.

In the context of the four principal transportation issues identified for the I-81 Corridor, the user services were reviewed for potential applications.

2. Long Term - Reconstruction

The conceptual improvement studies for the I-81 corridor identified the need to widen I-81 from four lanes to six and/or eight lanes with truck climbing lanes both northbound and southbound where required to accommodate the projected traffic in the design year of 2020. The entire 325-mile corridor was prioritized and initial funding to begin the engineering and environmental evaluation for the first priorities have been included in VDOT's Six Year Program.

The purpose of the I-81 improvements is to provide for the increased capacity and improve the safety and operational features of the roadway and all of the interchanges. The addition of truck climbing lanes is an essential part of the overall reconstruction, due to the fact that the original design of I-81 was for 15% truck traffic and there currently exists 19% to 40% truck traffic in the corridor.

Due to the need to reconstruct the entire 325 miles of I-81, the whole corridor cannot be reconstructed at one time; therefore, the corridor will be constructed in segments over the next 15 to 20 years. During the construction, the projects will be designed to minimize the impacts to the traveling public by maintaining a minimum of two lanes in each direction with temporary stoppages during off-peak periods as necessary.

E. Alternative Modes of Transportation

The possibility of utilizing other modes of transportation was raised in several of the meetings. The goal was to reduce the volume of traffic on I-81. The two approaches both seek to obtain the same objective of traffic reduction, but are quite different in methodology.

One of these suggestions related to reducing the volume of truck traffic by utilizing Rail in the "piggy-back" concept. This is known as Inter-Modal in the transportation industry. The recent changes that have occurred in rail shipping patterns in the East arising out of the dissolution of CONRAIL and its absorption by CSX and Norfolk Southern give added emphasis to this concept. The point was made that the economies on piggy-backing on such a long haul may make it more attractive for rail lines to promote this service; however, the difficulty in managing shipments, especially between railroads, must be overcome before this is a truly viable and equal alternative. This suggestion is presented because exploring and developing the concept will require assistance at the highest policy levels of Federal and State Governments, as well as in the senior leaderships of the rail industry.

The second approach relates to reduction of auto traffic on I-81, enabling commuter motorists to avoid in part the demands of Interstate driving. This proposal took two different forms: One suggestion urges the increase of commuter rail. A successful example is MARC commuter rail in Maryland, which extends from Brunswick, Maryland, near Harpers Ferry, to Washington D.C. The MARC Line also provides service to West Virginia, but the number of trains to West Virginia are significantly fewer than those originating and terminating in Brunswick. MARC Service has proved attractive not only to citizens of Western Maryland and West Virginia but also to Virginia commuters in the Leesburg/Purcellville area.

A substantial number of commuters in the northern Valley work in Northern Virginia and the District of Columbia. For the most part, this is a commute from West to East with some use of I- 81; but more significantly Routes 7, 50, and Interstate 66. The suggestion was made to explore the extension of commuter rail from Manassas to Front Royal or Strasburg, with consideration of a southern extension in the Valley from Strasburg to communities further south. Obtaining such commuter service would require the support of policy makers at the highest level of government and the cooperation of the transportation industry.

Several knowledgeable citizens made reference to the reduction of highway commuting by encouraging work at home for those who utilize telecommunications in a major part of their work when in the office. The point was made that permitting these people to "telework" or "telecommute" from home perhaps three to five days a week would result in the reduction of vehicles on the Highways. Federal tax credits have been proposed in the current budget to provide tax credits for businesses that utilize teleworking.

III. Conclusion - Creating "A Model Rural Intelligent Transportation Interstate"

In a practical sense, I-81 will become safer over time as the Virginia Department of Transportation moves forward with its "Safe Travel" campaign, implements more and more ITS based programs, and completes the reconstruction of the entire roadway. But that process, given current resources and priorities in the Commonwealth will take decades. The opportunity to develop a "model safety corridor" could be realized by a targeted effort using federal and State funds to jump-start the "safety" initiative. The

issuance of this report should be the first step in realizing this challenging, but crucial goal.

A "Model" would incorporate the following stages.

1) An overall coordination task force could be established to manage the effort, similar to the I-95 Corridor Coalition. In this case, the Coalition should include the transportation agencies involved as well as users, university research programs, and other significant stakeholders. A strategic plan should be produced to which all involved parties agree. Other states that I-81 traverses should also be included.

2) As part of the development of the coalition task force and the strategic plan, the first stage should be based on a clear understanding of the safety issues involved. This step would include a more rigorous analysis of crash statistics and determination of appropriate countermeasures, focus groups of affected users and knowledgeable experts, and traffic modeling based on actual traffic flows and current and projected vehicle volume and mix. The modeling effort should include adjacent routes, which could be used for traffic diversion during construction and for incident management purposes. As part of this stage, close coordination and communication would need to be established between the Virginia Department of Transportation, adjacent states, contractors, consultants, and university transportation research programs involved in I-81 program analysis and pre-deployment testing and evaluation.

3) The second stage would be the deployment of "near term" technologies such as traveler information and monitoring systems and regional and district Operation Centers, based on priorities established in the strategic plan process.

4) The third stage would be accelerated testing of mid range and longer-term technology for use in vehicles and/or infrastructure. This could include improved pavement markings, lane departure technology for cars and trucks, enhanced safety equipment for commercial vehicles such as rear view radar, obstacle detection and collision avoidance technology, and understanding human issues affecting alertness while driving for both passenger cars and commercial vehicles.

5) The fourth stage would integrate planning for the development of the "model" corridor based on existing and long-term technology into the planning for the reconstruction of the corridor and subsequent maintenance strategies.

This level of coordinated effort would not be inexpensive, but it would only cost a small fraction of the personal and property damage, congestion and delay, and the subsequent cost of reconstruction and expansion of the I-81 corridor. Table 2 outlines important considerations to guide the future.

Table 2: ITS User Services and their Relevance to the I-81 Corridor

No.	ITS User Service	Service Description	Applicable to Issues			
			Work Zone	Safety	Trucking	Intercity Traveler Needs
Travel and Transportation Management						
1	En-Route Driver Information	Provides driver advisory and in-vehicle signing after travel begins	X	X	X	X
2	Traveler Services Information	Provides quick access to travel related services and facilities			X	X
3	Traffic Control	Manages the movement of traffic on freeways and streets	X	X	X	X
4	Incident Management	Helps quickly identify incidents and coordinate appropriate actions in response to them	X	X	X	X
5	Route Guidance	Provides a suggested route to reach a destination	X		X	X
6	Emissions Testing and Mitigation	Provides information for monitoring air quality and developing air quality improvement strategies				
Travel Demand Management						
7	Pre-Trip Travel Information	Provides information for assisting pre-trip schedule				X
8	Demand Management and Operations	Generates and communicates management and control strategies that reduce the number of individual travel				
9	Ride Matching and Reservation	Provides real-time ride matching information and reservations				
Electronic Payment						
10	Electronic Payment Services	Allows travelers pay for transportation services electronically				
Emergency Management						
11	Emergency Notification and Personal Security	Provides immediate notification of an incident and an immediate request for assistance	X	X	X	X
12	Emergency Vehicle Management	Reduces the time it takes for emergency vehicles to respond to an incident		X		
Commercial Vehicle Operations						
13	Commercial Vehicle Electronic Clearance	Facilitates domestic and international border clearance, minimizing stops			X	
14	Automated Roadside Safety Inspection	Facilitates roadside inspections			X	
15	On-Board Safety Monitoring	Senses the safety status of a commercial vehicle and driver			X	
16	Hazardous Material Incident Notification	provides immediate notification of an incident and immediate request for assistance		X	X	
17	Commercial Vehicle Administrative Process	Provides electronic purchasing of credentials and automated mileage and fuel reporting			X	

No.	ITS User Service	Service Description	Applicable to Issues			
			Work Zone	Safety	Trucking	Intercity Traveler Needs
Commercial Vehicle Operations (Cont.)						
18	Commercial Fleet Management	Provides communications between drivers, dispatchers and intermodal transportation provides			X	
Advanced Vehicle Control and Safety Systems						
19	Longitudinal Collision Avoidance	Helps prevent head-on and rear-end collisions between vehicles and other objects	X	X	X	X
20	Lateral Collision Avoidance	Helps prevent collisions when vehicles leave their lane of travel	X	X	X	X
21	Intersection Collision Avoidance	helps prevent collisions at intersections				
22	Vision Enhancement for Crash Avoidance	Improves the driver's ability to see the roadway and objects on the roadway	X	X	X	X
23	Safety Readiness	Provides warnings regarding the condition of the driver, the vehicle and the roadway	X	X	X	X
24	Pre-Crash Restraint Deployment	Anticipates an imminent collision and activates passenger safety systems prior to collision	X	X	X	X
25	Automated Highway System	Provides a fully automated operating environment		X	X	X
Public Transportation Management						
26	En-route Transit Information	Provides information to travelers using public transportation				
27	Public Transportation Management	Automates operations, planning and management functions				
28	Personalized Public Transit	Provides flexible routes				
29	Public Travel Security	Creates a secure environment for public transportation patrons and operators				

Source for User Services and Description: National ITS Program Plan (ITS America & USDOT, May 1994)

The I-81 corridor is a vital lifeline for southwest Virginia and for much of the eastern section of the United States. With heavy traffic and especially heavy truck volume, there is a need to focus on traffic and truck safety. Educational programs and the application of technology hold the key to future success. Reconstruction of the interstate is necessary to handle the volume of traffic forecasted for the future. The Commonwealth has made a commitment to the reconstruction, but actual construction is still years away and will take at least two decades to complete. There is, however, an opportunity to take immediate steps to understand the traffic safety issues, develop both short-term and mid-term strategies to address safety concerns, and develop a "Model Traffic Safety Corridor" in Virginia. Such efforts will require a healthy infusion of additional funding from both Federal and Commonwealth sources. The next step will be to establish a collaborative process with VDOT and adjacent states in further identifying and prioritizing ITS applications for potential implementation.

IV. Appendices

A. Appendix A
Minutes from Winchester, VA Meeting – March 29, 1999

Public Comments Received
Interstate-81 Safety Task Force Meeting
Winchester, Virginia
March 29, 1999

1. Mile marker signs
   -every 1/10th mile
   -upkeep mile marker signs
2. Install more rumble strips on the left and right side of highway
3. Road Signs
   -illuminate
   -flashing lights on speed limit signs
   -more frequent "Radar Detectors Illegal" signs
4. Build bridges wide enough to accommodate future expansion
5. Extend Route 37 around City of Winchester to serve as bypass
6. Outfit bridges with remote video camera to monitor traffic conditions such as:
   -speed
   -weather
   -delays
7. Outfit rest areas and weigh stations with remote video cameras
8. Acquire right-of-way to expand in the future
9. Additional cross-overs for emergency response vehicles
10. Do construction in segments in order to limit disturbances
11. Provide tax incentives to ship goods by means other than highway
12. Have Congress provide more Hazard Elimination grants through FRA[1]
13. Increase enforcement of speed limits
14. Separate truck traffic from regular traffic particularly at busy intersections
15. Create "local" and "thru" lanes in busy areas
16. Develop passenger rail along I-81
17. Extend acceleration and deceleration lanes
18. Prohibit use of CB radios to communicate information about speed traps
19. Solicit input from truck drivers and trucking companies
20. VDOT provide contact for I-81 questions and comments
21. Provide more rest areas
22. Consider alternatives to Stephens City intersection

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[1]In the FY 00 DOT appropriations bill, Congressman Wolf included a provision reducing the state/local match in the rail/road crossing program from 10 to 0%.

B. Appendix B
Minutes from Abingdon, VA Meeting – June 21, 1999

Summary Notes
Second Meeting of the Interstate-81 Safety Task Force
June 21st, 1999, 10:00 AM
Abingdon, Virginia

The second meeting of the I-81 Safety Task Force convened in Abingdon, Virginia at the Southwest Virginia Higher Education Center at 10:00 AM. The Honorable Jack Marsh, Chairman, presided. Commissioners in attendance were: The Honorable Rick Boucher, Mr. James Browder, Ms. Joyce Curtis, Dr. John Noftsinger, Mr. Dick Phillippi, and Captain John Quinley.

James Browder of the Virginia Department of Transportation provided an overview of the 3.4 billion-dollar initiative to rebuild the 325-mile I-81 corridor by the year 2020. He noted that only 35 miles of the 325-mile interstate will not have a median strip.

Captain John Quinley of the Virginia State Police shared the law enforcement perspective and related challenges regarding enhancing safety in the I-81 Corridor. He provided details regarding the initiative to reduce speeding by increased traffic law enforcement. He noted that 17,000 violations have been cited during the crackdown.

Ray Pethtel, Transportation Fellow and Associate Director of the Center for Transportation Research at Virginia Tech presented on the following topics:

- Smart Road Test Bed and Test Track
- Trucking Studies
  -- Long Haul, Sleep Quality and Driver Performance
  -- Short Haul, Incidents and Driver Fatigue
  -- Micro DAS, Naturalistic Passing Behavior
- Traffic Modeling on I-81
- I-81 Traveler Information System
- I-81 / I-77 Overlap at Wytheville (pending)
- SW Virginia Multi-Modal Transportation Plan (proposed)

Chairman Marsh asked for public comment. The comments were as follows:

- A number of persons expressed concern over the proposed 300-foot buffer required by VDOT at interchanges as a part of the rebuilding process.
- It was recommended that the Virginia State Police increase safety seminars at truck stops and increase the involvement of the safety officers of trucking companies in their enforcement.
- Concern was expressed about the impact of truck and car pollution from the interstate on the quality of air, health, noise, and viewshed.

The next meeting of the Commission is tentatively scheduled for August 12th in Lexington, VA.

*Respectfully submitted, John B. Noftsinger, Jr., Secretary of the Commission.

C. Appendix C
Minutes from Lexington, VA Meeting – August 12, 1999

Summary Notes
Third Meeting of the Interstate-81 Safety Task Force
August 12th, 1999, 1:00 PM
Lexington, Virginia

The third meeting of the I-81 Safety Task Force convened in Lexington, Virginia at Virginia Military Institute. The Honorable Jack Marsh, Chairman, presided. Commissioners in attendance were: Mr. Robert Berstresser, Mr. James Browder, Ms. Joyce Curtis, Congressman Bob Goodlatte, Col. Jim Groves, Mr. Doug Houff, Dr. John Noftsinger, Mr. Dick Phillippi, Captain John Quinley, and Mr. Paige Will.

Congressman Bob Goodlatte provided an update on federal initiatives affecting I-81. He announced that the House of Representatives has approved 1.5 million dollars for Intelligent Transportation Systems for I-81. He is optimistic that the Senate will also approve the measure. He emphasized the role that variable messaging signage could play in enhancing safety.

Captain John Quinley of the Virginia State Police shared the law enforcement perspective and related challenges regarding enhancing safety in the I-81 Corridor. He provided details regarding the initiative to reduce speed by increased traffic law enforcement. He noted that more than 17,000 violations have been cited during the crackdown. He announced funding for four Motorist Assistance Aids that will be operating in the Roanoke vicinity by September. These aids will allow troopers to be relieved from some safety calls and increase their focus on enforcement issues.

Fred Altizer of the Virginia Department of Transportation Salem Office provided a VDOT update. He detailed the traffic mix of I-81 and noted that it is no longer truly a rural interstate. He highlighted a variety of short-range actions that VDOT is taking. These include: rumble strips, guardrail improvements, permanent overhead variable message signs, safety service patrols, highway advisory radio (i.e. "Travel Virginia") and construction improvements. Long-range plans for VDOT will focus on interchange improvements and strategic widening in urban areas.

Ray Pethtel, Transportation Fellow and Associate Director of the Center for Transportation Research at Virginia Tech presented on the following topics: An Analysis of I-81 Accidents, Understanding and Modeling Traffic Characteristics, "Travel Virginia" Traveler Information System, Vehicle and Infrastructure Technology Developments, and Work Zone Safety Enhancements. He highly recommended supporting VDOT's ITS Deployment Plan.

Joyce Curtis of the Federal Highway Administration commented on the federal perspective regarding safety. She focused on variable messaging signage, work zone enhancements and access control, including the 300 foot buffer requirement that VDOT is recommending for the reconstruction of the I-81 corridor.

Congressman Bob Goodlatte asked about a variety of constituent concerns including: increased use of guardrails in the center median strip, the implementation of "Travel Virginia" in the Roanoke and New River Valleys, and enhanced citizen input utilizing mobile telephones.

Delegate Steve Landes recommended a joint state and federal initiative to widen I-81 to four lanes.

A number of public comments were heard, submitted by Thurman S. Wright, including the following:

1) Reduce the speed limit to 60 mph for trucks and maintain 65 for cars with no exceptions other than passing.
2) Make it a federal law that retreads are illegal and cannot be used even on the inside of trailers.
3) Cut down shrubs (like in the vicinity of the Arcadia Exit between mileposts 167 and 168). These prevent drivers from seeing what is shuttling across the median towards them and certainly offers no resistance to a vehicle out of control.
4) Install solar detectors along the highway, eliminating so many troopers and mail the offender (speeder) a ticket and make it too expensive for a rerun.
5) Issue more tickets for young people who seem to feel that with their legal freedoms, they can do no wrong.
6) With the global population expected to reach six billion in twenty years, I don't think additional lanes will solve the problem.
7) Reinstate the toll booths, as this will discourage some traffic on to old Route 11 and put more money in the till to assist with road improvements.
8) There is something radically wrong with the elevation of the lanes in the vicinity of the Arcadia section (between mileposts 167 & 168).

Robert S. Rucker recommended a new interstate east of U.S. Highway 29 between Danville and I-66 to relieve pressure on both I-81 and I-95.

Carol Smith expressed the concern shared by many about the safety considerations of the Arcadia area and the need for signage.

Bob Gay recommended enhanced public safety education and improved deceleration lanes.

Nancy Warren expressed her general concerns about I-81 and recommended that trucks be limited to the right lane and their speed limited to 55 mph.

Robert Fordsman expressed a concern about the travelling public's indifference to rescue personnel and recommended more troopers for enforcement.

Fred Brinkson echoed the need for trucks to be limited in their speed and recommended more undercover police cars and increased fines.

Mark Callahan expressed the appreciation of his clients to elected officials and VDOT in their efforts to find an acceptable compromise to the proposed 300 foot buffer requirement at interchanges.

Bob Magnolli recommended the need to increase taxes in order to expedite the widening of I-81.

Clay Harrison expressed concerns about the impact of the widening of I-81 on the alternate corridors.

Leo Turner recommended a separate truck lane separated by a fence.

**Respectfully submitted, John B. Noftsinger, Jr., Secretary of the Commission.*

D. Appendix D
Minutes from Woodstock, VA Meeting – November 29, 1999

Summary Notes
Meeting of the Interstate-81 Safety Task Force
November 29th, 1999, 1:00 PM
Woodstock, Virginia

The fourth meeting of the I-81 Safety Task Force convened on November 29th, 1999, in Woodstock, Virginia at the John O. Marsh National Guard Armory. The Honorable John O. (Jack) Marsh, Chairman, presided. Commissioners in attendance were: Mr. James Browder, Ms. Joyce Curtis, Col. Jim Groves, Mr. Doug Houff, Dr. John Noftsinger, Mr. Ray Pethtel, Mr. Dick Phillippi, Captain John Quinley, and Mr. Billy Vaughn (for Mr. Paige Will). Others in attendance: Mr. Craig Feister (Office of Motor Carrier Safety - VA).

Secretary Marsh presented David Whitestone of Congressman Wolf's office with a Washington Cup in recognition of his service to the Commission. David is departing government service for private law practice.

In the ongoing effort to inform the Commission of innovations in transportation, Mr. Roger Hoopengardner, SAIC, presented on his company's initiatives in the area of "Technology for Highway Safety" and shared a handout.

Secretary Marsh invited persons in attendance to make public comments. There were no public comments. Secretary Marsh then explained the process the Commission will employ to complete its work. He noted that the Commission will focus on safety and will reflect findings from the public meetings. He emphasized that the Commission has no official power to commit federal or state officials to implement recommendations related to the findings.

The Commission agreed to submit its report to Congressmen Wolf, Goodlatte, and Boucher by the end of January. The Commission agreed that the goal of the report would be to position the I-81 Corridor to be the first rural model for Intelligent Transportation Systems in the nation.

The Commission went into Executive Session to discuss the format and content of the report. Commissioners were asked to submit their portions of the report to Dr. Noftsinger by e-mail (noftsijb@jmu.edu) by December 15th, 1999.

The meeting concluded at 3:30 PM.

**Respectfully submitted, John B. Noftsinger, Jr., Secretary of the Commission.*

E. Appendix E

Letters submitted to the I-81 Safety Task Force are available upon request.

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